ANALYSIS OF THE LSD FLASHBACK

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In a recent *Good Housekeeping* article (9), a vivid account was given of Diane Linkletter's suicide which was blamed on the spontaneous recurrence of a bad LSD experience which she had 6 months prior to her death. This widely publicized case has helped set-up the national media's publicity campaign against LSD by utilizing quick and easy slogans such as "LSD Can Turn On You" and "After Only One Trip, It Can Recur at Any Time." Along with controversial "chromosome damage," the "flashback," or recurrence of the LSD experience without further ingestion of the drug, is the most widely publicized reason not to take LSD. But does the flashback exist? It has never been demonstrated in the laboratory and was seldom reported in the early days of controlled LSD research. We feel the flashback does exist, and this paper is designed to describe the clinical syndrome of LSD flashbacks in relationship to the other types of adverse reactions occurring with this powerful drug.

The flashback or "spontaneous recurrence" (16) is but one type of adverse reaction to the psychedelic drugs such as LSD. Others include neurological adverse reactions (3) (convulsions), prolonged psychotic or non-psychotic reactions, and acute anxiety or panic states, better known as "bad trips." The flashback must particularly be distinguished from the prolonged psychotic or non-psychotic reaction.

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This paper will give a more detailed clinical analysis of the flashback with therapeutic guidelines for the physician who may have a patient in distress from such a recurrence.

BASIS OF CLINICAL EXPERIENCE

The Haight-Ashbury Free Clinic is an outpatient medical and psychiatric facility located in the center of San Francisco's Haight-Ashbury district. Since 1967, the clinic has had over 50,000 patient visits, and we have had a unique opportunity to observe the full gamut of adverse reactions to various drugs in over 3 years of operation. The population of the Haight-Ashbury community has had extensive experience with the full range of drugs subject to misuse, but the original New Community used primarily "pot" and "acid." The change in population of the community to include compulsive users of heroin, amphetamines, and barbiturates, has been described by Shick and his colleagues (14).

At first, when the population was inexperienced with the effects of LSD, we saw mostly acute panic states, or "bad trips," occurring *during* the LSD intoxication. Presently, as is characteristic of a more experienced drug-using population, all but the worst anxiety reactions are handled by the subject's friends, and we are seeing more patients with complaints of prolonged reactions or flashbacks.

The overall use of LSD has decreased in the Haight-Ashbury since its peak in the summer and fall of 1967 (14), and it is said to have declined all over the nation. We feel the decline is more apparent than real since LSD use has become more diffuse, less centered in San

Francisco, and more difficult to observe as the outer trappings of the hippie culture have become the fashion. Habitual use of LSD (several times a week) has declined markedly in the Haight, and those persons who are compulsive drug abusers have changed to other drugs (14). In September 1967 85% of the Haight-Ashbury population had tried LSD at least once and 14% were habitual users; by March 1968 again 85% had tried the drug but only 6% were habitually using it, and by August 1968, its habitual use had continued to decline while experimental use remained constant. The habitual use of amphetamine and heroin increased over the same period (21).

We speculate that greater numbers try LSD at least once, and that there still remains a large number of ritualistic users (14) who use the drug on a regular basis but not often enough to label their use habitual. As the knowledge about LSD experiences and after-effects spreads to a wider number of people, and as greater numbers of people become relatively sophisticated in its use and treat themselves or others within the community, the incidence of acute panic reactions which find their way to psychiatric-medical facilities declines and, consequently, should not be used as an index of general use.

The prolonged adverse reactions to the psychedelics which we presently see are primarily flashbacks and persistent depressions, occasionally of psychotic proportions, as well as schizophrenic reactions in predisposed individuals. Although most of the "drug reactions" seen at the clinic in the first months of operation in 1967 were related to LSD ingestion, now the majority are related to heroin, amphetamine, and barbiturate use because both the population and the drugs of choice have changed. During the 1967 phase, a very large number of bad LSD trips were treated in the clinic's "Calm Center" and many of these patients sought long-term treatment in the Clinic's psychiatric annex directed by Dr. Stuart Loomis. The analysis of the LSD flashback contained in this paper will be derived primarily from the collective clinical experience of the Haight-Ashbury Clinic staff in treating this large patient population.

HISTORICAL REVIEW OF LSD FLASHBACK

In 1965 Leuner reported one case of a spontaneous recurrence (10), and Cohen and Ditman described two such cases occurring with LSD psychotherapy (4). When the experiences were supervised and the patients preselected, they rarely occurred. However, with the increased indiscriminate use of psychedelic drugs beginning in 1966 we began to see increasing numbers of patients who complained of flashbacks.

The early brief accounts (4) of these recurrences stressed the perceptual changes (described as visual illusory or hallucinatory material) and the concomitant anxiety which the authors observed. However, in our experience, those who did not have anxiety as a consequence of these perceptual recurrences rarely sought medical attention, and spontaneous recurrences after psychedelic drugs encompass a far wider range of symptoms. These same accounts did, however, correctly observe that the flashbacks tend to occur during times of stress. The term "persistent hallucinosis" was used by Rosenthal to describe the flashbacks occurring in a young woman patient; he thought they represented "psychotic decompensations related *specifically to multiple exposures*" (12; italics theirs). Flashbacks occur not only after multiple ingestions and are often seen after a single "bad trip." Although the 3 cases described by Frosch and his co-workers occurred in patients who were schizophrenic (6), flashbacks can occur in normal individuals who have no serious psychopathology. In fact, as described by Bowers and Freedman, acute schizophreniform psychoses may mimic psychedelic experiences (2), and should not be confused with flashbacks, although LSD may precipitate both flashbacks and schizophreniform illnesses in susceptible individuals. Flashbacks with drugs other than LSD have been described by Smith (18) and Keeler (7)

THE FLASHBACK PHENOMENON

We define the flashback as transient spontaneous recurrences, usually multiple, of certain aspects of the psychedelic drug effect occurring after a period of relative normalcy following the original intoxication. They are recurrent episodes of perceptual and/or emotional distortions of varying degrees of severity and duration, which may be sought by some and feared by others, but which in whole or in part are reminiscent of the precipitating drug experience. The universal features are that they are transient and that in the interval periods the patient returns to normal and is free of any toxic manifestations of the drug. They are not continuous with the drug intoxication as are the prolonged reactions. The flashback may occur after a single experience with any psychedelic drug† such as LSD, STP, mescaline, etc., but usually occurs after multiple exposures.

†We specifically wish to exclude marijuana and its congeners from our category of psychedelic drugs on pharmacological grounds (10b, 14), although marijuana "flashbacks" were reported by Keeler, and we do not deny that they may occur with that drug.

We are aware of prolonged cyclical reactions occurring after i.v. amphetamine abuse where the patient reports recurrent feelings of paranoid thoughts and auditory hallucinations, and these have been termed flashbacks by some. Others confuse flashbacks with the cyclical variation in symptoms of a schizophreniform reaction to LSD which is a prolonged psychotic decomposition. We prefer to class these as prolonged reactions since there are really no "normal" periods between episodes, and the symptomology is more characteristic of a schizophreniform process. Waxing and waning depression occurring after psychedelic use is common and is properly a prolonged depressive reaction to LSD, not a flashback. True flashbacks have a "drug" quality about them, including geometric patterns, shimmering or undulating fields of vision, depersonalization, derealization and anesthesias or paresthesias which creep or move over the body. The panic and anxiety which is often experienced may be either a fear of the symptoms and what they may mean to the patient in terms of "brain damage" or "loss of control" or "losing one's mind," etc., or may reproduce the same panic felt at the time of the intoxication.

Typical flashbacks last from minutes to hours, may occur once a week or several times a day, and may happen in any setting. Most frequently they occur just before going to sleep, while driving, while intoxicated with another psychoactive drug (marijuana, alcohol, amphetamines, tranquilizers), or in periods of psychological stress. They are reported to occur while being in the company of someone under the influence of LSD (the "contact high"), with intense flashing lights (e.g., a rock music light show), with meditation, and with a variety of other mind-altering techniques. However, there is no question that the flashback can occur "spontaneously" when the person is seemingly under no stress and is functioning normally.

CATEGORIZATION OF THE VARYING TYPES OF LSD FLASHBACKS

In terms of their primary effects, flashbacks can be divided into 3 categories: *perceptual*, *somatic*, and *emotional*. The somatic and emotional flashbacks are far more distressing to the patient and almost always occur after a "bad trip" or anxiety or panic reaction.

The Perceptual Flashback.—Spontaneous recurrences of the visual effects of the LSD experience are the most common type of flashback in the patient population seen at the Haight-Ashbury Clinic Psychiatric Annex. Many of the patients had extensive experience with LSD in the 1966-67 time period when the drug was most popular in our area, but stopped for a variety of psychological and social reasons (14) including "bad trips."

The most widely publicized aspect of the LSD flashback has been the recurrence of the perceptual aspects of the drug experience. In terms of distress to the patient, this may be the least significant of the flashback effects. Those patients who seek help for the perceptual flashback are usually doing so because of anxiety over being "brain damaged" or "going crazy" rather than because of any specific debilitation caused by the flashbacks. It is also important to recognize that many people who have perceptual flashbacks do not interpret them negatively, and, in fact, some acid heads enjoy them as "free" LSD trips. Keeler felt that only where recurrence "precipitates anxiety or interferes with function" should it be viewed as an adverse reaction (7).

Patients' complaints range from the most minor visual changes (such as illusions of colors seeming more intense or shimmering, or the visual field being made up of dots of color) through geometric patterns (including faces changing shape or objects and scenes flowing or melting) to frank visual hallucinations (such as crawling bugs or skulls). Whether the more minor of these are flashbacks, or merely states of altered awareness providing a background upon which flashbacks may more likely occur, is debatable.

The possibility of "LSD-altered" visual perception cannot be excluded and may be an underlying factor in the production of perceptual flashbacks, though we are inclined to doubt its importance. Blacker's study of chronic LSD users reported no organic damage, but frequency-analyzer EEG techniques and visual evoked response data from the subjects ". . . gave evidence of [their] being uniquely sensitive to low intensity stimulation . . . [seeming] . . . to modulate and organize sensory input in a different fashion." (1) The incidence of flashbacks among these subjects was unreported.

It may be that subjects are experiencing normal visual phenomena but are only associating them with remembered LSD experiences. It may also be that their experience with LSD has lowered the threshold for these phenomena. As explained by Keeler (7), subjects while intoxicated may become sensitized to perceptual possibilities within the range of normal human experience and afterwards be more attentive to such occurrences.

Furthermore, visual perceptual distortions are common phenomena in normal populations and may best be thought of as lying on a continuum from "normal" percpetion through daydreaming, nightmares, sleep hallucinosis, hypnagogic states of near sleep or near waking, eidetic imagery, dream illusions, memory images and after-images, pseudohallucinations and hallucinations.

Recently Fischer presented a holistic conceptualization of this continuum and noted that "motor deprivation or restriction" may be characteristic of these states (5). Thus, mere motor restriction of movement such as occurs before going to sleep, in highway driving, or with meditation may be sufficient to trigger flashbacks in susceptible individuals. Such states are known to encourage dissociative phenomena in normal individuals (5).

The Somatic Flashback.—Transient recurrent states of altered bodily sensation following the use of LSD constitute a much rarer but more serious type of flashback. The patient may have recurrent feelings of numbness, parasthesias, pain or a variety of other somatic sensations. Almost always the somatic flashback occurs after a bad LSD trip, and in some patients reproduces an experience felt during that adverse drug reaction as demonstrated by the following case.

Case 1.—A 23-year-old white, anxious male came to the Haight-Ashbury Clinic seeking help for an LSD flashback. Six months prior he had taken LSD and became quite frightened because of "numbness" which started on the soles of his feet and crept up his legs until it involved his scrotum. This feeling faded as he came down from his bad trip. He became very frightened because of this experience and had stopped taking LSD, although he smoked marijuana and drank wine on occasion. However, 6 months after this adverse drug reaction he noted the sudden onset of numbness in his feet which moved up his legs and involved his genital region. Although this reaction faded after several minutes, the patient became acutely anxious and sought help at the Haight-Ashbury Clinic. He denied having feelings similar to this prior to his LSD experience. They recurred periodically for several months after the initial episode.

Often the symptomology of the flashback, particularly the somatic type, is reminiscent of conversion reactions in an hysterical patient. We believe such symptoms to be dissociative reactions which are "learned" during an initial LSD experience and later repeated in times of stress, disinhibition, or motor restriction.

The Emotional Flashback.—The most dangerous of the flashbacks are those in which the patient has a spontaneous recurrence of a particularly disturbing emotion. The recurrent emotions may be loneliness, panic or fear, and may be so intense that the patient considers or actually attempts suicide as demonstrated in the following case.

Case 2.—A 21-year-old white female sought help at the Haight-Ashbury Clinic for recurrent feelings of panic followed by extreme loneliness after a bad LSD experience 4 weeks previously. The patient had these frightening flashbacks during the day, while walking down the street, after smoking marijuana or drinking wine, during the night, and occasionally even while asleep. In one situation she awoke during the middle of the night with a feeling of panic and began running around her house fleeing an imagined threat she could not identify or comprehend. She had taken LSD a number of times, but her last few trips were bad ones with panic and fright followed by loneliness to the point of suicidal despair when she "came down." The combination of bad trips and emotional flashbacks made her seek professional help because of her fear that she would harm herself.

Various states of psychopathology may underlie the flashbacks, and often encountered are the prolonged depressions seen after LSD, particularly after a bad trip or experience where positive reentry is not facilitated. As Bowers and Freedman (2) have observed, the need for synthesis and outcome of the LSD experience is paramount, and if the experience falls short of this, as often is the case when LSD is used indiscriminantly, a depression may ensue. But the fluctuating symptoms of a depressive reaction or acute schizophrenic episode should not be mistaken for a true flashback.

MECHANISM OF ACTION

Originally, flashbacks were attributed to the persistence of LSD in the central nervous system; when evidence accumulated that tissue levels were correlated with psychological effect and the half life of LSD in plasma was found to be only 175 minutes (19), the persistence of a yet undiscovered metabolite was postulated. This view is untenable when the widely varying differences in onset and duration of flashbacks are considered.

The possibility of a neurophysiological change secondary to LSD has been considered, and the visual evoked response data (1) mentioned previously leads some credence to this view. Yet such changes have not been looked for among persons who have used the drug only once, and this finding may be only a result of chronic LSD use. That perceptual flashbacks may be the result of semipermanent changes within the retina or optic pathways has been reviewed by Rosenthal (12).

A widely held view is that LSD flashbacks represent a novel way of reacting to stress learned while in the LSD state. A similar mechanism for learning the "profound non-aggressive attitudes" of chronic LSD users was discussed by Blacker and his co-authors (1). Neuronal associative pathways, present to varying degrees in us all, may be facilitated with LSD ingestions so that they now comprise part of the more accessible response repertoire of the individual. However, Leuner felt that

the recurrences were due to a loosening of previously well-organized defense mechanisms and the inability to cope with stresses presented later on (10).

Experiments in hypnosis with users and non-users of LSD reveal that while parts of the LSD experience can be induced in non-users with suggestions by the therapist, the entire state can be duplicated only in hypnotic subjects who have previously experienced the LSD state. It is as if the LSD experience itself crystalizes altered ways of responding into an integrated whole, which can then be recalled. That flashbacks may be predominantly perceptual, somatic, or emotional remains unexplained; we might attribute the differences to variations in personality or in social reinforcement.

The possibility of flashbacks being frank dissociative reactions of the type seen in hysterical reactions has not been explored. Hypnotic and dissociative states are continuous with normal states of concentration, and on EEG either may show sleeplike patterns or hyperarousal states. Dissociative reactions are characterized by dissociation from conscious awareness of sensory or motor events which are taking place. In neurological terms, there is a dissociation of the neocortex from paleocortical structures (the limbic system or the visceral brain). Dissociative states include such normal or paranormal phenomena as hypnosis, automatic writing, daydreaming, highway hypnosis, the hypnagogic state, sleep paralysis, mystical trances and ecstatic experiences in religious rites, the feeling of *deja vu* and *Weltzchmerz*, cosmic consciousness, sleepwalking, hallucinations, and dreams, as well as such clinical phenomena as hysterical anesthesia or paresthesia, amnesia, fugue state, and multiple personality (20).

Several circumstances may permit the production of dissociative states, for instance, where "attention is fixed by a narrow range of stimuli, monotonously presented" as in hypnosis (15). In the presence of "information input overload, where reality testing is blocked due to the strength and quantity of the incoming signals, dissociative states may also be produced. This state corresponds to the type of hypnotic induction used with staged shows, or to the LSD state where arousal is high and subjects report a "flood of thoughts," or in states producing traumatic neuroses. Furthermore, practically any type of alteration of brain function, as in organic pathologies or drug-induced states, lends itself to dissociative reactions.

It is evident that the psychedelic drug state lends itself to dissociative reactions. The derealization, depersonalization as well as the cosmic consciousness attendent with intoxication above a minimal dose are examples of this. The commonest cause of dissociative reaction in clinical practice is an acute anxiety state (15). Likewise, flashbacks, particularly those of a somatic or emotional type, are associated with acute panic reactions, i.e., bad trips.

LSD intoxication facilitates the production of a dissociation reaction which may become self-maintaining. Freedman has explained that flashbacks resemble the recurrent nightmares or flashes which are seen in traumatic neuroses (5b). Just as the recurrent bad dreams in a traumatic neurosis are interpreted as repetative attempts to master the traumatic material, the flashback too is an attempt to master the unconscious, panic-inducing material released in the bad trip. As Freedman points out with the traumatic neuroses, "Failure to master provokes even new attempts to do so." (11)

Several of the case histories in the literature of patients with flashbacks are indicative of hysterical symptomology. Rosenthal's young woman had a history of fugue states, (12) and two cases of another series were thought by examiners to have hysterical predispositions (4). Kleber's patient had recurrences of perceptual alterations and "anxiety, a sinking feeling and paralysis . . . [being] unable to move or call . . . ;" however, "any external sensations such as a radio playing or a telephone ringing, would bring him out of it at once." (8) Both the symptomology of the flashbacks and the presence of limited conscious control is reminiscent if not diagnostic of dissociation reaction.

We do not mean to assert that all or even most of the patients with flashbacks are "hysterical personalities." In fact, even in clinical practice only a minority of patients with dissociative or conversion reactions show "hysterical personalities," but there is often a striking association with depression (15). Furthermore, dissociative phenomena clinically are more common in the very young immature grains or in the old where they often herald the onset of organic brain syndromes.

Much remains to be learned about the connection between bad trips and flashbacks. Could some patients be amnesic for the precipitating episode in the bad trip, as are some persons who develop a traumatic neurosis? Would they be helped by hypnotherapy? Would another LSD experience, supervised by an experienced therapist, be effective? What measure of control do patients have over their flashbacks? Will motor restriction or sensory isolation bring them on? Are they associated with underlying depressions in some? Do they herald early organic pathology as hysterical reactions in later age often do? Are recurrent nightmares common among these patients? What is the EEG picture like during a flashback and, is it similar or dissimilar to that seen

while a patient is actually under the influence of LSD? These and many other questions must be answered before we can gain more than a superficial understanding of the flashback.

TREATMENT

In general flashbacks fade both in intensity and frequency with time if the individual stops using potent psychedelic drugs. Therapy is mainly supportive; one reassures the patient that the flashbacks will gradually fade away and assists him in handling any associated anxiety.

A variety of psychoactive drugs may trigger the recurrences, including amphetamines, marijuana, alcohol, and phenothiazines. In our experience the major tranquilizers do not control the recurrences and often exacerbate them or aggrevate the anxiety state by producing a "zombie-like" depression characteristic of the sedative quality of these drugs. The lack of effectiveness of chlorpromazine in treating LSD intoxication and adverse effects has been noted by several authors and was reviewed by Schwarz (13). Although we generally do not use chemotherapy in the treatment of the flashback, occasionally such sedatives as Librium®, Valium®, or phenobarbital may be used to control anxiety which may itself perpetuate the state. The patient should be cautioned to avoid psychoactive drugs and advised of the possible triggering situations noted previously in this article.

Sleep therapy used in the treatment of the traumatic neurosis where large doses of barbiturates were given for 1-2 days has not been tried extensively, but might be valuable. Especially where flashbacks occur just before going to sleep or in dreaming, the administration of potent hypnotics before sleep may stop the recurrences altogether.

We do not recommend the use of nicotinic acid or nicotinamide that some psychiatrists employ in the treatment of flashbacks. The therapeutic efficacy of these agents has not been established, and patients occasionally suffer adverse side effects as the result of administration of large doses of this vitamin.

Perceptual flashbacks are the most common, but the least incapacitating; the somatic and emotional flashbacks are of greatest concern to the health professional. The perceptual flashback may produce great anxiety in the individual, but the somatic and emotional flashbacks usually represent a more serious problem in psychopathology and in general require more extensive psychotherapy.

Any drug reaction is a complex interaction of chemical, personality and social variables; we attempt to deal with areas of personality difficulty which may have become recognized by the patient during the LSD intoxication. Some attempt should be made to assess accurately the nature of the previous LSD experiences and to determine the precipitating event in any bad trip. The content of the flashback and any similar content in the intoxication itself may provide clues.

Patients primarily want to be reassured that the flashbacks are not the result of "brain damage," and the therapist may have to go to the extreme of an EEG and complete neurological workup to demonstrate to the patient that he is not "irreversibly brain damaged," but in general simple reassurance is sufficient. The possibility of underlying psychopathology such as schizophreniform illness, depression, or organic pathology should be considered, particularly in resistant cases.

The proper treatment of a bad LSD experience includes utilizing the "talk-down approach" (18); in our experience this technique reduces the incidence of subsequent debilitating flashback phenomena. The restoration of a supportive environment and the establishment of a stable and trusted human reference point to facilitate positive reentry after a bad trip constitute part of this approach to treatment. In contrast to those who advocate the hospital padded cell and massive doses of Thorazine® as the proper treatment for the bad LSD experience, we find that this negative technique increases the incidence of flashbacks.

SUMMARY

A flashback is defined as a transient spontaneous recurrence, usually multiple, of certain aspects of the psychedelic drug experience occurring after a period of relative normalcy following the original intoxication and should be distinguished from prolonged psychotic and non-psychotic reactions to the psychedelic drugs.

Flashbacks are characterized by their transciency (lasting minutes to hours), their high rate of recurrence, and by a period of relative normalcy which intervenes between the intoxication and the first flashback. The prolonged reactions on the other hand are continuous with the intoxication itself and may not be recognized until days after when the patient complains he has continued to experience unusual feelings or ideas without letup since the intoxication. These may be psychotic or non-psychotic depressions, schizophreniform reactions, acute paranoid states (3), chronic anxiety reactions, but are more or less typical psychopathological entities. The bad trip of course is confined to the time period of the intoxication, i.e., 8-18 hours, and is usually an acute anxiety or panic state, sometimes with paranoid components and may progress to a prolonged reaction or

be associated with flashbacks of the experience later on, particularly if managed incorrectly.

The flashback is probably primarily psychological rather than chemical in nature, and may be related to traumatic events within the LSD intoxication itself. They are seen frequently after bad trips, many of which have been treated in a hospital setting, and although the bad trip appears to have etiological significance, its exact relationship has not been explored.

The flashback is not limited to LSD but can be seen after a variety of psychedelic drugs including in our experience, DOM (STP) and DMT. Several possible mechanisms for flashback phenomena are presented and discussed. They occur frequently but not exclusively with chronic use, and may occur after a single intoxication.

In treatment we reassure ourselves and the patient that the flashback phenomena do not represent organic pathology; we recommend abstinence from psychoactive drugs, but particularly the psychedelics, and we try to avoid chemotherapy. If any drugs are used at all in an attempt to control anxiety, we prefer the minor tranquilizers, Librium®, Valium® or phenobarbital, and find that the major tranquilizers often make flashbacks worse. At times a potent short-acting hypnotic is useful in inducing sleep where the flashbacks occur before sleep.

REFERENCES

1. Blacker, K. H., Jones R. T., Stone, G. C. & Pfefferbaum, D. "Chronic Users of LSD: 'The Acidheads.'" *Amer. J. Psychiat.* Vol. 125: 341-351. (September, 1968). (L7.C6)

2. Bowers, M. B., Freedman, D. X. "'Psychedelic' Experiences in Acute Psychoses." *Arch. Gen. Psychiat.* Vol. 15: 240-248. (September, 1966). (P6.P1)

3. Cohen, S. "A Classification of LSD Complications." *Psychosomatics.* Vol. 7: 182-186. (May-June, 1966). (L7.D8)

4. Cohen, S., Ditman, K. S. "Prolonged Adverse Reactions to Lysergic Acid Diethylamide." *Arch Gen. Psychiat.* Vol. 8: 475-480. (May, 1963). (L7.D20)

5. Fischer, R. "The Perception-Hallucination Continuum. (A Re-examination)." *Dis. Nerv. Syst.* Vol. 30: 161-171. (March, 1969). (H3.J7)

5b. Freedman, D. X. "On the Use and Abuse of LSD." *Arch. Gen. Psychiat.* Vol. 18: 330-347. (March, 1968). (L7.B4)

6. Frosch, W. A., Robbins, E. S. & Stern, M. "Untoward Reactions to Lysergic Acid Diethylamide (LSD) Resulting in Hospitalization." *New Eng. J. Med.* Vol. 273: 1235-1239. (2 December, 1965). (L7.D9)

7. Keeler, M. H., Reifler, C. B., & Liptzin, M. B. "Spontaneous Recurrence of Marihuana Effect." *Amer. J. Psychiat.* Vol. 125: 384-386. (September, 1968). (C7.D27)

8. Kleber, H. D. "Prolonged Adverse Reactions from Unsupervised Use of Hallucinogenic Drugs." *J. Nerv. Ment. Dis.* Vol. 144: 308-319. (April, 1967). (H3.D2)

9. Linkletter, A. "We Must Declare War on the Drugs that Killed My Daughter." *Good Housekeeping.* (April, 1970).

10. Leuner, H. "Present State of Psycholytic Therapy and its Possibilities." In. Abramson, H. (Ed.). *The Use of LSD In Psychotherapy & Alcoholism.* (Indianapolis, Indiana: Bobbs-Merrill, 1967). Pp. 101-116. (H3.T21)

10b. Meyers, F. H. "Pharmacologic Effects of Marijuana." In. Smith, D. E. (Ed.). *The New Social Drug.* (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1970). Pp. 35-40. (C7.P64)

11. Redlich, F. C. & Freedman, D. X. *The Theory and Practice of Psychiatry.* (New York: Basic Books, Inc., 1966).

12. Rosenthal, S. H. "Persistent Hallucinosis Following Repeated Administration of Hallucinogenic Drugs." *Amer. J. Psychiat.* Vol. 121: 238-244. (September, 1964). (H3.D1)

13. Schwarz, C. J. "The Complications of LSD: A Review of the Literature." *J. Nerv. Ment. Dis.* Vol. 146: 174-186. (February, 1968). (L7.D44)

14. Shick, J. F. E., Smith, D. E. & Meyers, F. H. "Patterns of Drug Use in the Haight Ashbury Neighborhood." *Clin. Toxicol.* (April, 1970).

15. Slater, E. & Roth, M. *Clinical Psychiatry.* (Baltimore: Williams & Wilkins, Co., 1969). Pp. 103-124.

16. Smart, R. G. & Bateman, K. "Unfavourable Reaction to LSD." *Canad. Med. Ass. J.* Vol. 97: 1214-1221. (11 November, 1967). (L7.D11)

17. Smith, D. E. & Rose, A. J. "The Use and Abuse of LSD in Haight-Ashbury. (Observations by Haight-Ashbury Medical Clinic)." *Clin. Pediat.* Vol. 7: 317-322. (June 1968). (L7.C7)

18. Smith, D. E. "The Psychotomimetic Amphetamines with Special Reference to STP (D.O.M.) Toxicity." *J. Psychedelic Drugs.* Vol. 2: 73-85. (1969). (D11.D1)

19. Wagner, J. G., Aghajanian, G. K. & Bing, O. H. "Correlation of Performance Test Scores with 'Tissue Concentration' of Lysergic Acid Diethylamide in Human Subjects." *Clin. Pharmacol. Ther.* Vol. 9: 635-638. (September-October, 1968) (L7.P11)

20. West, L. J. "Dissociative Reaction." In. Freedman & Kaplan. *Comprehensive Textbook of Psychiatry.* (Baltimore: Williams & Wilkins, 1968). Pp. 885-899.

21. Shick, J. F. E., Smith, D. E. & Myers, F. H. Unpublished Data.